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LABORATORY BULLETIN

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES, HELENA, MONTANA

No. 46

May 21, 1973

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STATE DOCUMENTS

Concerns in this issue: COLORADO TICK FEVER & CARBON MONOXIDE

MAY 29 1973

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COLORADO TICK FEVER



The tick season is well along and already there have been cases of Colorado Tick Fever (CTF). Again we wish to assist physicians in making a definitive diagnosis. The specimen to send to our laboratory is 5 ml. of whole clotted blood (do not use preservative or anticoagulant) taken as soon as the disease is suspected. A convalescent specimen should be sent about 24 days after onset to check for a rise in titer of complement-fixing antibodies. CTF antibodies are formed rather slowly so usually cannot be detected for at least 3 weeks.

The method we use for laboratory confirmation is to inoculate the clot from the acute specimen into "L" cell tissue cultures. If CTF virus is present, cytopathogenicity will be manifest in about 4 or 5 days. The serum is used for complement fixation for comparison with the convalescent specimen. Virus may be found in the blood for 8 days and there are reports of recovery of CTF from blood over much longer periods.

Although CTF is usually a self-limited infection, it can no longer be described as a non-fatal disease. In the last two years there have been reports of 2 deaths in children suffering from CTF. Sudden onset of fever, backache, and fatigue are common symptoms. Characteristically there is a leucopenia with WBC below 4000. Specific therapeutic measures are lacking. However, the disease is indistinguishable from Rocky Mountain spotted fever in its early stages and specific antibiotic therapy is available for the latter; and it is important to start this as soon as possible in a case of spotted fever.

The Rocky Mountain Laboratory holds a patent on a vaccine for CTF. Because it is made from mouse-brain tissue and may contain other viruses and brain antigen, it has not been licensed by FDA for general use. Experimentally it has proven to be a very effective prophylactic measure.

The ecology of CTF virus in the tick is quite different from that of spotted fever rickettsias. The virus is found in salivary glands so the tick merely has to insert his proboscis to infect. He may not like what he finds and drop off so there is not always a history of tick bite in CTF although there is one of exposure to ticks. In spotted fever the rickettsias are located in the gut of the tick so there must be some regurgitation on its part to infect. CTF virus is not passed along in ticks transovarially whereas rickettsias are. Therefore, a primary reservoir outside of the tick, such as Columbian Ground Squirrels, pack rats, or other rodents, are necessary to infect each generation of ticks. Infection rates in ticks usually run about 30 times higher for CTF virus than for spotted fever rickettsias.

Although only 13 cases of CTF were reported to the Department in 1972, we estimate that a minimum of 200 cases occur annually in Montana. Personal tick hygiene is still the most reliable prophylactic measure against all tick-borne diseases. Keep them off by wearing proper clothing and be tick-conscious so you can get rid of them promptly when you feel them crawling up the back of your neck. Hair should be examined frequently when in tick country; this is especially important in young children. The Rocky Mountain Laboratory in Hamilton has an excellent booklet on this subject: *"The Rocky Mountain Wood Tick - Beware Its Bite!"*

Infection rates in ticks vary widely from area to area. This has been particularly noticeable with CTF where highest rates have been found along streams and lower ones as you move up the mountainside. However, ticks are not to be trusted - wherever they are, the possibility of infection exists.

C A R B O N M O N O X I D E

As part of our highway alcohol program under "implied consent" we are paying increased attention to levels of carbon monoxide in blood. The preferred specimen is 3-5 ml. of whole blood containing an anticoagulant such as EDTA or sodium fluoride. The bottles supplied for collecting specimens for blood alcohol analysis are satisfactory. (Avoid heparin if possible.) Clotted blood can be used but is not a very satisfactory specimen. Levels of 20 to 30% saturation produce impaired judgement although death or coma usually occurs only at levels over 50%.

Specimens are analyzed in our laboratory on the gas chromatograph using thermal conductivity. In 66 specimens from highway fatalities, 16 were found to have detectable carbon monoxide levels. However, the average value was 6.4% - below the level which could be considered as contributing to the accident (many had high levels of alcohol). Here are the effects of carbon monoxide levels in the 5-10% range: "Slight breathlessness on severe exertion. Levels of 5-10% are found in smokers who inhale one or more packs of cigarettes per day. The effect of CO is far worse at higher altitudes." Also studies on freeways around Los Angeles have shown that CO is a greater hazard for those with heart disease.